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Abstract

EXTRACTION AND SOME CHEMICAL PROPERTIES OF TRANSPLUTONIUM ELEMENTS

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The transplutonium elements can be produced by the irradiation of heavy isotopes with high integral neutron flux.

To produce these elements for relatively short periods of time the SM-2 reactor with the $2.10^{15} n/cm^2/sec$ flux in the central channel was built in the USSR. There is a large radiochemical laboratory in the reactor building where transplutonium elements including Es and Fm are being extracted and their properties studied. The laboratory is equipped with 16 cells and 56 boxes. In the chambers and in the boxes the experiments with the activity up to 100 000 and I c, respectively, can be carried out. The total effective area of the laboratory is 20 200 m^2. The extraction of transplutonium elements is accomplished by separating them from a great number of fission products and first of all of rare earth elements whose chemical properties are essentially similar.

The extraction properties of these elements with neutral and phosphorous-organic acid compounds from water-salt solutions were studied. The complex formation constants of some transplutonium and rare earth elements with phosphorous organic compounds, mineral acids and a number of other compounds were determined.

Under the static and dynamic conditions the investigations of extractive separation of transplutonium and rare earth elements by phosphor-organic acid compounds and amines from chloride and rhodanide solutions were carried out.

Using these extragents a number of technological schemes of transplutonium element extraction with high yield and practically complete purification of these elements from fission products were obtained.

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